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ABSTRACT

The Ohio Vocational Achievement Tests are specially designed instruments for use by teachers, supervisors, and administrators to evaluate and diagnose vocational achievement for improving instruction in secondary vocational programs at the 11th and 12th grade levels. This guide explains the Ohio Vocational Achievement Tests and how they are used. The guide is divided into four sections. The first section explains the nature and purpose of the tests, including test development, what the battery measures, administration, organization of the tests, and sample test items. The second section covers statistical data concerning the tests including reliability and the standard error of measurement. In the third section, uses of the test battery are explained. Benefits mentioned are the improvement of instruction, school and community research, and student benefits. In the last section, information on using the test results is provided. Appendixes to the guide contain sample forms and results of the tests. (KC)

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THE OHIO VOCATIONAL EDUCATION ACHIEVEMENT TEST PROGRAM

State Department of Education

Division of Vocational Education

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TRADE AND INDUSTRIAL EDUCATION

THE OHIO STATE UNIVERSITY

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1978

PREFACE

The Ohio Vocational Education Achievement Test Program has proven to be a most effective tool for improving instruction. It is a unique and valuable instrument for school administrators, supervisors, teachers and guidance counselors working in a vocational program of instruction.

The purpose of the Achievement Test Program is outlined by the following eight goals:

1. to help determine if the objectives of instruction have been achieved.
2. to provide a basis for reviewing the curriculum and improving instruction.
3. to provide motivation for students and teachers.
4. to identify facility and equipment deficiencies.
5. to assist in the process of supervision.
6. to help identify strengths and weaknesses of the instruction.
7. to help identify strengths and weaknesses of the student.
8. to help evaluate reference materials.

The Achievement Test Program is a sound technique for evaluation by vocational and technical leaders, as they plan and implement self-assessment procedures to improve programs and instruction.

The testing program is the responsibility of the Testing and Research Section of the Instructional Materials Laboratory.

Byrl R. Shoemaker
Executive Director, Vocational Education

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THE NATURE AND PURPOSE OF THE OHIO VOCATIONAL ACHIEVEMENT TESTS

The Ohio Vocational Education Achievement Test battery grew out of demands by Ohio educators for instruments which measured success in occupational areas. The tests are specially designed instruments for use by teachers, supervisors and administrators for evaluational and diagnosis of vocational achievement for the improvement of instruction. These tests are not designed to be used as a counseling instrument although some information may be obtained from the test results that can contribute to an overall counseling program. The tests are intended for use in secondary vocational programs at the eleventh and twelfth grade levels.

The Achivement Tests were originated in 1958, at the Ohio Trade and Industrial Education Local Supervisor's Workshop. During 1978 tests in Agricultural, Business and Office, Distributive and Home Economics Education were added. Prior to 1963, the distribution of the tests was limited to Ohio. However, the states of Illinois, Indiana, Kentucky, West Virginia, Delaware, Massachusetts and the District of Columbia have participated on a statewide basis. Individual schools from other states have also requested and used the test battery.

TEST DEVELOPMENT

Recommendations by local supervisors of Vocational Education and the projected number of programs and enrollments are utilized to determine the occupation for which a test is to be developed. A committee is appointed by the applicable State Assistant Director, Vocational Education, to develop an achievement test. This committee is comprised of a representative of the state supervisory staff, a teacher-educator, selected teachers of the course, where possible a non-teacher member of the occupation and a representative of the Ohio State University, Instructional Materials Laboratory. The development phases are as follows:

1. A comprehensive Occupational Task/Activity Analysis is developed which identifies the skills and knowledge necessary to correctly perform each task of the occupation.
2. Based on the Task/Activity Analysis, the committee develops and reviews test questions.
3. The Instructional Materials Laboratory compiles, publishes and distributes the test. They also provide scoring, reporting and evaluation of test results.
4. After the first year of administration, the test is revised by the committee using an extensive item analysis. Each question is reviewed on the basis of types of responses made by students. If the analysis indicates a question is faulty, the item is either replaced, rewritten or eliminated.
5. A validation study of the new tests is accomplished during the first year of administration. An evaluation of the results of administration to uninstructed students in the tenth (10th) grade, students in the first year of instruction or eleventh (11th) grade, students in the second year of instruction or twelfth (12th) grade and job incumbents who have been employed in the occupation no more than two years. The test items not contributing to the test are revised or eliminated.
6. The test is then available for use in schools having approved vocational programs.
7. Each year the Task/Activity Analysis and Achievement Tests are reviewed for applicability to current occupational practices and requirements. Revised Analyses and Achievement Tests are developed as soon as is practical.

WHAT THE TEST BATTERY MEASURES

All tests should be evaluated in terms of the school's vocational objectives and philosophy. A student's test performance begins with the subject area scores and proceeds through the subdivisions of the tests. The greatest value of achievement testing is obtained when the sub-test scores are utilized in evaluation and diagnosis.

THE CALIFORNIA SHORT FORM TEST OF ACADEMIC APTITUDE, LEVEL 5

This test is intended for use in secondary schools and includes working with verbal and non-verbal concepts in comprehending relationships among ideas presented in various forms.

The test is composed of four sub-tests, each separately timed. Sub-tests of vocabulary and memory are included in the Language section, while the sub-tests of analogies and sequences constitute the Non-Language section. The Language section contains items measuring verbal comprehension, word meanings and retentive ability. The Non-Language section consists of measuring recognition, measuring pictorial analogies (opposite and similarities) and comprehension of numerical and geometric pattern sequence changes.

THE OHIO VOCATIONAL ACHIEVEMENT TESTS

The occupational tests were developed to measure skills and understanding in specific vocational areas. Students are requested to: (1) solve problems, (2) analyze data, (3) recall specific facts, (4) have a knowledge of principles, (5) react to generalizations, (6) be able to use abstractions in specific situations and (7) put together parts to form a complete structure. Technical information regarding the occupational tests is found in the next section of this booklet.

The Ohio Vocational Achievement Tests and the California Short Form Test of Academic Aptitude are normed on the same population; therefore, generalizations can be made about an individual's intelligence and achievement scores by using the annual percentile norm sheet (see Page 23). It may be anticipated that an individual's academic aptitude percentile should correspond approximately to his achievement percentile. The academic aptitude test results will give the teacher an indication as to how the students are using their mental capacity in a particular vocational area.

ADMINISTRATION

The Ohio State Department of Education, Division of Vocational Education, offers the testing service as a total package program. The test booklets are considered controlled items and are not for sale, nor are they released for review or study. All test materials are returned to The Instructional Materials Laboratory after use. This is to protect the validity of the user norms which are developed each year. To assure that teachers are instructing according to the local plans and program, rather than pointing toward test results, teachers should not see or administer the Achievement Test in their instructional field.

The Achievement Tests are administered during any three consecutive school days during the first three weeks of March. The first day of testing is devoted to providing the proper demographic information and administration of the California Short Form Test of Academic Aptitude (SFTAA). Time requirements for the first day of testing is approximately one hour. The Occupational portion of the Achievement Test Battery is administered during the second and third days of testing. Time requirements are dependent upon the occupational area and range from 2 hours to 2½ hours each day. The following indicates the desired schedule and the required time:

Day	Test	Time
1	SFTAA	1 hour
2	Vocational Achievement Test Part I	2-2½ hours
3	Vocational Achievement Test Part II	2-2½ hours

ORGANIZATION OF THE TESTS

All students are expected to complete the entire test battery which is composed of the California Short Form Test of Academic Aptitude and the Vocational Achievement Test. The tests and sub-tests are as follows:

THE CALIFORNIA SHORT FORM TEST OF ACADEMIC APTITUDE (1970)

The Language section contains:

(1) 25 items in the Vocabulary sub-test of word meanings, verbal comprehension and word relationships.

(2) 20 items in the Memory sub-test of retentive ability which is based on a story read to the students at the beginning of the test period.

The Non-Language section consists of:

(1) 20 items in the Analogies sub-test requiring the recognition of relationships which may be literal or symbolic.

(2) 20 items in the Sequences sub-test requiring the demonstration of comprehension of a pattern, rule or principle, as indicated by a series of numbers, letters or geometric figures.

THE OHIO VOCATIONAL ACHIEVEMENT TESTS

Agricultural Education

Horticulture (1979)

(1) Part I has 6 sections with 181 items: (1) Soil and Plant Science, (2) Production Floriculture, (3) Retail Floriculture, (4) Garden Center, (5) Personal Development and (6) Fruit and Vegetable Production.

(2) Part II contains 4 sections with 168 items: (7) Turf Services, (8) Nursery, (9) Landscaping and (10) Equipment and Mechanics.

Business and Office Education

Clerk-Stenographer (1979)

(1) Part I consists of 3 sections and 160 items: (1) Dictation, (2) Correspondence and (3) Financial Records.

(2) Part II has 4 sections and 113 items: (4) Communications, (5) Copy Reproduction, (6) Record Management and (7) Personal Development.

Distributive Education

Food Marketing (1979)

(1) Part I contains 5 sections and 197 items: (1) Employment Procedures, (2) Human Relations, (3) Business Principles, (4) Communications and (5) Financial Operations.

(2) Part II is composed of 6 sections and 195 items: (6) Public Relations, (7) Service Technology, (8) Product Information, (9) Pricing, (10) Operations and (11) Advertising and Display.

Health Occupations Education

Dental Assisting (1971)

(1) Part I contains 7 sections and 150 items in the following areas: (1) Orientation, (2) Ethics, (3) Dental Anatomy, (4) Dental and Laboratory Materials, (5) Microbiology and Sterilization, (6) Preventive Dentistry and (7) Operative-Chairside Assisting.

(2) Part II contains 6 sections and 150 items in the following areas: (8) Specialties-Chairside Assisting, (9) Radiology, (10) Pharmacology, (11) Oral Pathology, (12) Diet and Nutrition and (13) First Aid and Dental Emergencies.

Medical Assisting (1975)

(1) Part I has 4 sections and 171 questions in the following areas: (1) Orientation, (2) Body Systems, (3) Clinical Assistant Skills and (4) Medications.

(2) Part II consists of 5 sections with 121 items in the following areas: (5) Sterilization, (6) Medical Office Skills, (7) Laboratory Skills, (8) Electrocardiography and (9) X-Ray.

Diversified Health Occupation (1975)

(1) Part I consists of 7 sections and 125 items in the following areas: (1) Orientation, (2) Emergency First Aid, (3) Dental Assisting Skills, (4) Medical Assisting Skills, (5) Communications and Office Skills, (6) Laboratory Skills and (7) Preparing for the World of Work.

(2) Part II consists of 155 items in the Clinical Skills area, including: (8) Asepsis, (9) Vital Signs, (10) Positioning and Draping, (11) Physical Examinations, (12) Transfer and Ambulation, (13) Patient Units, (14) Patient Personal Care, (15) Pre-op Care and (16) Emergencies.

Home Economics Education

Nursery School Teacher Aide (1979)

(1) Part I has 7 sections with 146 items: (1) Child Care Careers, (2) Center Administration, (3) Maintenance, (4) Program Planning, (5) Evaluation, (6) Special Need Children and (7) Health and Safety.

(2) Part II consists of 5 sections and 123 items: (8) Activity Selection, (9) Structured Activity Preparation, (10) Unstructured Activity Supervision, (11) Routine Activity Supervision and (12) Nutrition and Snacks.

Trade and Industrial Education

Automotive

Auto Body Mechanics (1979)

(1) Part I has 6 sections and 169 items: (1) Welding, (2) Repair and Straighten, (3) Patch and Fill, (4) Fiberglass Repair, (5) Panel Replacement and (6) Refinishing.

(2) Part II is composed of 8 sections and 166 items: (7) Trim and Hardware, (8) Glass Replacement, (9) Frame and Unit Body Repair, (10) Suspension Systems, (11) Engine Cooling Systems, (12) Air Conditioning, (13) Electrical Systems, (14) Shop Management and Operations.

Automotive Mechanics (1977)

(1) Part I consists of 7 sections and 169 items in the following areas: (1) Service Management, (2) Lubrication and Preventive Maintenance, (3) Engine Service and Repair, (4) Cooling Systems, (5) Fuel and Exhaust Systems, (6) Ignition Systems and (7) Cranking Systems.

(2) Part II contains 9 sections and 156 items: (8) Charging System, (9) Accessory Systems, (10) Transmissions, (11) Drive Line, (12) Emission Systems, (13) Brake Systems, (14) Steering Systems, (15) Suspension Systems and (16) Heating, Ventilation and Air Conditioning Systems.

Construction Trades

Carpentry (1975)

(1) Part I consists of 7 sections and 134 items in the following areas: (1) Orientation, (2) Blueprint Reading, (3) Applied Math, (4) Applied Science, (5) Foundation, (6) Floor Framing and (7) Wall Framing.

(2) Part II consists of 6 sections and 138 items in the following areas: (8) Roof Framing, (9) Roofing, (10) Insulation, (11) Exterior Finish, (12) Interior Finish and (13) Special Operations.

Construction Electricity (1974)

(1) Part I has 10 sections and 152 items in the following areas: (1) Orientation, (2) D.C. Electricity, (3) Magnetism, (4) D.C. Power Sources, (5) D.C. Motors and Controllers, (6) Instrumentation, (7) A.C. Electricity, (8) A.C. Circuits, (9) Three-Phase A.C. Electricity and (10) Transformers.

(2) Part II contains 8 sections and 127 items in the following areas: (11) A.C. Motors and Starters, (12) Electronics, (13) Planning and Layout, (14) Branch Circuits, (15) Wiring Methods, (16) Lighting, (17) Heating and Air Conditioning and (18) Low Voltage Systems.

Heating, Air Conditioning and Refrigeration (1977)

(1) Part I consists of 4 sections and 151 items: (1) Installing Refrigeration and Air Conditioning Equipment, (2-A) Troubleshooting Refrigeration and Air Conditioning Equipment - Electrical, (2-B) Troubleshooting Refrigeration and Air Conditioning Equipment - Mechanical and (3-A) Service and Repair Refrigeration and Air Conditioning Equipment - Electrical.

(2) Part II contains 6 sections and 151 items: (3-B) Service and Repair Refrigeration and Air Conditioning Equipment - Mechanical, (4) Installing Warm Air Heating Systems, (5-A) Troubleshooting Warm Air Heating Systems - Electrical, (5-B) Troubleshooting Warm Air Heating Systems - Mechanical, (6-A) Service and Repair Warm Air Heating Systems - Electrical and (6-B) Service and Repair Warm Air Heating Systems - Mechanical.

Electronics

Communication Products Electronics (1974)

(1) Part I consists of 5 sections and 152 items in the following areas: (1) Orientation, (2) D.C. Electricity, (3) A.C. Electricity, (4) Electron Tubes and (5) Semi-Conductors.

(2) Part II has 6 sections and 182 items in the following areas: (6) Basic Vacuum Tube and Solid State Circuitry, (7) Audio Services, (8) Receivers, (9) Transmitters, (10) Television and (11) Business Practices.

Industrial Electronics (1974)

(1) Part I contains 5 sections and 152 items in the following areas: (1) Orientation, (2) D.C. Electricity, (3) A.C. Electricity, (4) Electron Tubes and (5) Semi- Conductors.

(2) Part II consists of 13 sections and 142 items in the following areas: (6) Schematic Drawings, (7) Power Supplies, (8) D.C. Timers, (9) A.C. Timers, (10) Heavy Current Conductors, (11) Sequence Timers, (12) Welding, (13) Sensors, (14) Heaters, (15) Magnetics, (16) Rotating Machinery, (17) Servos and (18) Logic Systems.

Graphic Communications

Drafting (1977)

(1) Part I has 10 sections with 170 items in the following areas: (1) Geometric Drawing, (2) Orthographic Projection, (3) Pictorial Drawing, (4) Sectional Views, (5) Auxilary Views, (6) Drafting Materials, Equipment and Reproduction Methods, (7) Dimensioning, (8) Production/Working Drawings, (9) Fastening Methods and (10) Industrial Materials and Processes.

(2) Part II consists of 7 sections with 150 items: (11) Intersections and Developments, (12) Mechanisms, (13) Architectural Drawings, (14) Structural Drawings, (15) Electrical Drawings, (16) Civil Engineering Drawings and (17) Mathematics.

Lithographic Printing (1977)

(1) Part I contains 6 sections and 169 items: (1) Layout and Design, (2) Composing, (3) Paste Up, (4) Proofing, (5) Camera and Film Processing and (6) Stripping.

(2) Part II has 3 sections and 149 items: (7) Platemaking and Proofs, (8) Off-Set Presses and (9) Finishing Operations.

Metal Trades

Machine Trades (1975)

(1) Part I contains 6 sections and 146 items: (1) Orientation, (2) Bench Work, (3) Power Sawing, (4) Drilling Machines, (5) Lathes and (6) Blueprint Reading.

(2) Part II has 6 sections and 160 items in the following areas: (7) Milling Machine, (8) Shaper-Planer, (9) Abrasive Machining, (10) Heat Treating and Applied Metallurgy, (11) Applied Math and (12) Applied Science.

Sheet Metal (1964)

(1) Part I has 144 items covering 7 sections: (1) Blueprint Reading, (2) Applied Science, (3) Applied Mathematics, (4) Hand Tools Operations, (5) Machine Operations, (6) Soldering and (7) Special Operations.

(2) Part II has 100 items and 7 sections: (8) Mechanical Drawing, (9) Freehand Sketching, (10) Metals, (11) Non-Metallic, (12) Layout Operations, (13) Fabricating Operations and (14) Welding.

Welding (1979)

(1) Part I contains 3 sections and 168 items: (1) Labor and Management, (2)Oxyacetylene Welding and (3) Shielded Metal Arc Welding.

(2) Part II has 4 sections and 165 items: (4) Tungsten Arc Welding, (5) Gas Metal Arc Welding, (6) Resistance Welding and (7) Blueprint and Math.

Personal Services

Cosmetology (1979)

(1) Part I contains 6 sections and 188 items: (1) Sanitation, (2) Scalp Care, (3) Manicure, (4) Hair Shaping, (5) Hair Styling and (6) Facials.

(2) Part II is composed of 4 sections and 175 items: (7) Permanent Waving, (8) Hair Coloring, (9) Applied Science and (10) Shop Management and Mathematics.

SAMPLE TEST ITEMS

All questions are multiple choice, with four possible responses: one is correct and the other three are distractors. Examples from the various tests follow:

THE CALIFORNIA SHORT FORM TEST OF ACADEMIC APTITUDE
Sample Questions

Mark the numeral of the word that means the same or about the same as the first word.

A. Diminish
   1. obtain
   2. repeat
   3. reduce
   4. plentiful

The first picture is related to the second. The third picture is related to one of the last four in the same way. Find the related picture and mark its numeral.

B.

THE OHIO VOCATIONAL ACHIEVEMENT TESTS

Agricultural Education

Horticulture - Sample Questions

A. Which of the following materials would raise the pH of a soil?
   1. Peat moss
   2. Lime
   3. Superphosphate
   4. Perlite

B. Which wiring technique is most appropriate for wiring a stephanotis blossom?
   1. Hairpin
   2. Hookwire
   3. Clutchwire
   4. Piercing

Business and Office Education

Clerk-Stenographer - Sample Questions

A. The proofreader's mark to instruct the typist to ignore the correction made is:
   1. ≡
   2. ⌐
   3. stet
   4. ∩

B. If the copy produced by a stencil duplicator is marked with ink on the back of the paper, the:
   1. feed rollers are dirty.
   2. stencil has too much ink.
   3. bottom rollers are dirty.
   4. stencil has a hole in it.

Distributive Education

Food Marketing Key Employee - Sample Questions

A. "Pulling down" the store means:
   1. to face all of the merchandise.
   2. to level out all of the merchandise.
   3. to turn out all of the labels.
   4. to rotate all of the merchandise.

B. The best pricing instrument to use for marking frozen foods and dairy products is:
   1. the 5-band stamper.
   2. the stick-stamp set.
   3. a waterproof grease pencil.
   4. a label gun.

Health Occupations Education

Dental Assisting - Sample Questions

A. The face of an amalgam condensor is:
1. serated only.
2. smooth only.
3. serated or smooth.
4. beaver tailed.

B. Which of the following has its own nerve and blood supply?
1. Cementum
2. Dentin
3. Enamel
4. Bone

Medical Assisting - Sample Questions

A. While taking a blood pressure, the mercury should be lowered at the rate of:
1. 1-2 mm. per heartbeat.
2. 2-4 mm. per heartbeat.
3. 4-6 mm. per heartbeat.
4. 6-8 mm. per heartbeat.

B. An I.V.P. is an x-ray examination of the:
1. stomach.
2. kidneys.
3. gall bladder.
4. chest.

Diversified Health Occupations - Sample Questions

A. A podiatrist is a physician who is a:
1. child specialist.
2. specialist in mental diseases.
3. general M.D.
4. hand and foot specialist.

B. Hemoglobin refers to:
1. plasma.
2. iron.
3. antibodies.
4. serum.

Home Economics Education

Nursery School Teacher Aide - Sample Questions

A. Select the equipment which best provides opportunity to develop small muscle coordination:
1. coloring books.
2. scissors.
3. tricycles.
4. large ball.

B. Articulation disorders of omission, distortion and substitution are problems involving:
1. speech.
2. hearing.
3. vision.
4. muscles.

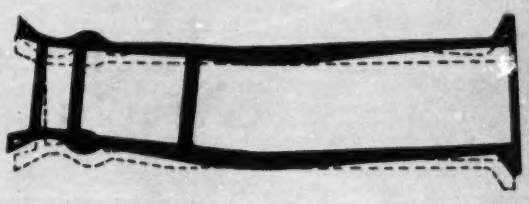
Trade and Industrial Education

Automotive

Auto Body - Sample Questions

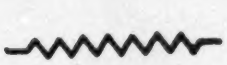
A. Streaking of metallic color coats may be caused by:
1. non-uniform application.
2. improper reduction.
3. cross coating.
4. improper air pressure.

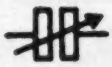
B. Identify the type of frame damage below:
1. side sway.
2. diamond.
3. twist.
4. kick-up.

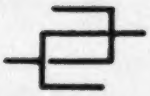


Automotive Mechanics - Sample Questions

A. Which symbol is used to indicate a resistor in an electrical circuit?

1. 

3. 

2. 

4.

B. A low reading on a compression test of two adjacent cylinders indicates:
1. a blown head gasket.
2. bad valves.
3. burning oil.
4. valves sticking.

Construction Trades

Carpentry - Sample Questions

A. The horizontal member that supports the floor joists is known as a:
1. collar tie.
2. stud.
3. bearing post.
4. girder.

B. A 22' x 22' gable roof garage has a 14' common rafter including the overhang. How many sheets of plywood would be needed to cover this roof?
1. 10½ sheets.
2. 20 sheets.
3. 26 sheets.
4. 38 sheets.

Construction Electricity - Sample Questions

A. Insulation testing should be accomplished by having the circuit de-energized and using:
1. an ammeter.
2. a voltmeter.
3. a scope.
4. a meggar.

B. The tool that is used for bending rigid conduit is called:
1. an EMT bender.
2. a "hickey".
3. an "idiot stick".
4. a radius tool.

Heating, Air Conditioning and Refrigeration - Sample Questions

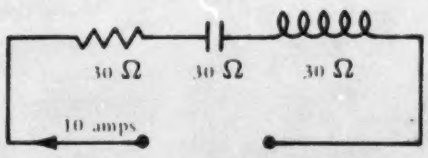
A. Before attaching a manifold guage, the service valve stem should be:
1. back seated.
2. front seated.
3. one-half way in.
4. cracked.

B. The step-down transformer in a residential oil fired furnace is located in the:
1. manual switch box.
2. ignition transformer.
3. limit switch.
4. primary control.

Electronics

Communication Products Electronics - Sample Questions

A. In the illustrated circuit, the power used would be:
1. 3000 watts.
2. 333 watts.
3. 1000 watts.
4. 2000 watts.



B. A television receiver has normal raster, but no picture or sound. This indicates that:
1. the deflection circuits are working.
2. the deflection circuits are not working.
3. the high voltage circuit is not working.
4. the low voltage supply is not functioning.

Industrial Electronics - Sample Questions

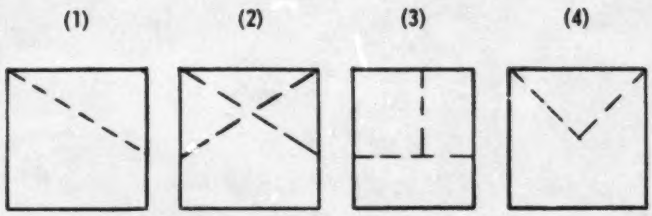
A. The schematic drawing depicts a:
   1. solid state diode.
   2. PNP transistor.
   3. NPN transistor.
   4. NPNPN transistor.

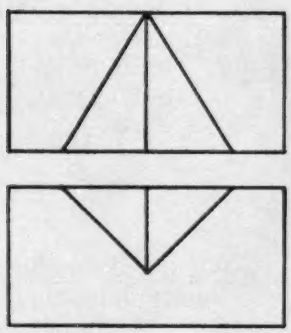
B. If a shunt type generator has no output voltage regardless of the speed of rotation, the probable cause of the trouble is:
   1. the shunt field windings are partially shorted.
   2. the load is insufficient.
   3. the generator turning in the wrong direction.
   4. no residual magnetism.

Graphic Communications

Drafting - Sample Questions

A. Choose the correct left side view.





B. The reason for an auxilary view is to show:
   1. the slanted surface in its true shape and size.
   2. the correct contour of the object.
   3. the exact interior of the object.
   4. all the parts in a true relationship to each other.

Lithographic Printing - Sample Questions

A. Autoscreen film will produce a screened halftone positive when contact printed with a continuous tone:
   1. autopositive.
   2. paper print.
   3. positive.
   4. negative.

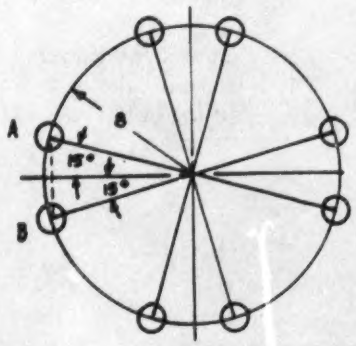
B. If you have a clear image on the press blanket and the image is poor on the paper you should:
   1. increase the blanket pressure.
   2. decrease the blanket pressure.
   3. increase the impression pressure.
   4. decrease the impression pressure.

Metal Trades

Machine Trades - Sample Questions

A. The center to center distance on a straight line between A and B is equal (Note: the sine of 15^{o} = .2588) (Formula: Sine of an angle = $\frac{\text{side opposite}}{\text{hypotenuse}}$

1. 4.4211
2. 4.2411
3. 4.4141
4. 4.1408



B. Coolants are used on the milling machine to:
1. cool the work, clear chips and lubricate the tool.
2. dispose of chips and lubricate the machine.
3. clean the work, lubricate the machine and cool the chip.
4. permit greater clearance on the cutter.

Sheet Metal - Sample Questions

A. The shears that are specially designed for cutting assembled pipe of various sizes are called:
1. double cutting shears.
2. hawkbill snips.
3. bench shears.
4. compound lever shears.

B. Because copper has a high rate of expansion, we must, when doing "Flashing" work, be careful to avoid:
1. especially long sections.
2. using elastic caulking compound.
3. using 50-50 solder.
4. using galvanized alongside.

Welding - Sample Questions

A. When the amperage is set too low on vertical up weld the bead will be:
1. convex.
2. flat.
3. sunk in.
4. under cut.

B. The after flow in TIG welding is to:
1. protect the tungsten from the atmosphere.
2. clean the hoses.
3. cool the ceramic nozzle.
4. cool the collet and collet holder.

Personal Services

Cosmetology - Sample Questions

A. When boosters are added to hair lighteners they:
   1. release oxygen.
   2. thicken the lightening mixture.
   3. act as a conditioning agent.
   4. prevent the lightener from drying out.

B. Saprophytes are classified as:
   1. non-pathogenic organisms.
   2. pathogenic organisms.
   3. vegetable parasites.
   4. animal parasites.

STATISTICAL DATA

RELIABILITY

SHORT FORM TEST OF ACADEMIC APTITUDE, LEVEL 5 (SFTAA)

Over 16,000 eleventh grade students were involved in the standardization sample to obtain the following data as reported by the test authors.

TABLE I

Short Form Test of Academic Aptitude	Mean	Standard Deviation	Reliability Coefficent KR 20	Standard Error of Measurement
Non Language Section	29.2	7.15	.88	2.38
Language Section	30.5	8.28	.90	2.75
Total	59.7	14.08	.93	3.69

OHIO VOCATIONAL ACHIEVEMENT TESTS

The reliability sample consisted of Ohio High School juniors and seniors who were involved in the Vocational Achievement Test construct validation studies. Test reliability scores give some indication of the confidence which a test user may place in a given test; however, the standard error of measurement is usually more usable in indicating how adequatley an obtained score represents a true score. Table II presents Vocational Achievement Test reliability coefficients, means and standard deviation for Ohio junior and seniors. Table III presents the standard error of measurement for the Vocational Achievement Tests.

TABLE II

OHIO VOCATIONAL EDUCATION ACHIEVEMENT TESTS - 1978

OCCUPATION AND GRADE	MEDIAN	MEAN	STANDARD DEVIATION	RELIABILITY COEFFICIENTS K-20	K-21
Agricultural Education					
Horticulture					
Juniors (N=315)	146.00	141.45	41.71	.955	.950
Seniors (N=224)	167.00	163.05	45.00	.961	.955
Business and Office Education					
Clerk-Stenographer					
Juniors (N=378)	151.00	145.24	34.45	.953	.941
Seniors (N=303)	173.00	166.33	38.30	.964	.953
Distributive Education					
Food Marketing					
Juniors (N=44)	123.00	119.25	42.51	.967	.963
Seniors (N=142)	136.00	132.81	43.68	.969	.963
Health Occupations Education					
Dental Assisting					
Juniors (N=361)	149.00	150.81	30.61	.953	.947
Seniors (N=305)	181.00	179.20	31.53	.970	.966
Medical Assisting					
Juniors (N=202)	129.00	124.56	49.76	.983	.981
Seniors (N=210)	159.00	146.47	55.92	.988	.987
Diversified Health Occupations					
Juniors (N=902)	179.00	174.05	27.73	.962	.953
Seniors (N=610)	190.00	187.34	27.18	.962	.952
Home Economics Education					
Nursery School Teacher Aide					
Juniors (N=316)	151.00	143.98	33.04	.964	.958
Seniors (N=254)	161.00	158.18	31.21	.969	.962
Trade and Industrial Education					
Automotive					
Auto Body Mechanics					
Juniors (N=1408)	146.00	143.56	44.21	.963	.960
Seniors (N=995)	177.00	172.52	50.78	.973	.969
Automotive Mechanics					
Juniors (N=2611)	131.00	132.13	38.58	.954	.950
Seniors (N=2050)	162.00	161.15	49.71	.973	.970

TABLE II
(continued)

OHIO VOCATIONAL EDUCATION ACHIEVEMENT TESTS -1978

OCCUPATION AND GRADE	MEDIAN	MEAN	STANDARD DEVIATION	RELIABILITY COEFFICIENTS K-20	K-21
Construction Trades					
Carpentry					
Juniors (N=1336)	132.00	130.38	38.22	.962	.957
Seniors (N=1080)	161.00	153.66	48.01	.978	.975
Construction Electricity					
Juniors (N=781)	112.00	111.80	31.38	.943	.935
Seniors (N=539)	132.00	132.80	35.40	.956	.948
Heating, Air Cond. & Refrigeration					
Juniors (N=424)	128.00	126.92	36.90	.955	.949
Seniors (N=318)	158.00	152.36	43.14	.968	.963
Electronics					
Communication Products Electronics					
Juniors (N=749)	138.00	139.30	38.41	.955	.948
Seniors (N=649)	170.00	171.34	51.78	.976	.972
Industrial Electronics					
Juniors (N=566)	116.00	115.84	35.75	.955	.948
Seniors (N=409)	137.00	137.15	40.98	.966	.960
Graphic Communications					
Drafting					
Juniors (N=942)	124.00	124.80	34.29	.947	.941
Seniors (N=743)	145.00	141.60	38.35	.958	.952
Lithographic Printing					
Juniors (N=630)	121.00	121.17	26.01	.911	.891
Seniors (N=457)	132.00	128.19	33.89	.950	.935
Metal Trades					
Machine Trades					
Juniors (N=1457)	139.00	140.34	41.03	.964	.958
Seniors (N=1203)	173.00	170.10	44.81	.971	.966
Sheet Metal					
Juniors (N=62)	94.5	92.82	21.09	.904	.890
Seniors (N=42)	100.5	98.14	20.54	.930	.921
Welding					
Juniors (N=1357)	142.00	142.13	42.64	.963	.958
Seniors (N=1084)	181.00	172.89	55.65	.979	.976
Personal Services					
Cosmetology					
Juniors (N=1824)	189.00	184.93	43.98	.965	.958
Seniors (N=1577)	213.00	207.99	44.65	.969	.961

THE STANDARD ERROR OF MEASUREMENT

The standard error of measurement helps a test interpreter determine the size of a discrepancy in a test score of an individual. The formula: (1)

$$r_{t\infty} = s_t\sqrt{1-r_{tt}} \text{ or Standard Error} = \text{Standard Deviation}\sqrt{1-\text{Reliability Coefficient}}$$

is used to find the standard error measurement ($S.E._m$) for the Ohio Vocational Achievement Tests.

An estimate of the dispersion of a group obtained scores form corresponding true scores are reported as the $S.E._m$ for the Achievement tests using two reliability coefficients in the following Table III.

TABLE III

OHIO VOCATIONAL EDUCATION ACHIEVEMENT TESTS - 1978
STANDARD ERROR OF MEASUREMENT

OCCUPATIONAL TEST	N	STANDARD ERROR OF MEASUREMENT K-20	K-21
Agricultural Education			
Horticulture			
Juniors	315	8.85	9.33
Seniors	224	8.89	9.55
Business and Office Education			
Clerk-Stenographer			
Juniors	378	7.45	8.37
Seniors	303	7.27	8.30
Distributive Education			
Food Marketing			
Juniors	44	7.72	8.18
Seniors	142	7.69	8.40
Health Occupations Education			
Dental Assisting			
Juniors	361	6.64	7.05
Seniors	305	5.46	5.81
Medical Assisting			
Juniors	202	6.49	6.86
Seniors	210	6.13	6.38
Diversified Health Occupations			
Juniors	902	5.41	6.01
Seniors	610	5.30	5.95

(1) Guilford, J.P., Fundamental Statistics in Psychology and Education, McGraw - Hill Book Company, 1956.

TABLE III
(continued)

OHIO VOCATIONAL EDUCATION ACHIEVEMENT TESTS - 1978
STANDARD ERROR OF MEASUREMENT

OCCUPATIONAL TEST	N	STANDARD ERROR OF MEASUREMENT K-20	K-21
Home Economics Education			
Nursery School Teacher Aide			
Juniors	316	6.27	6.77
Seniors	254	5.50	6.12
Trade and Industrial Education			
Automotive			
Auto Body Mechanics			
Juniors	1,408	8.50	8.84
Seniors	995	8.34	8.94
Automotive Mechanics			
Juniors	2,611	8.27	8.63
Seniors	2,050	8.17	8.61
Construction Trades			
Carpentry			
Juniors	1,336	7.45	7.93
Seniors	1,080	7.12	7.59
Construction Electricity			
Juniors	781	7.49	8.00
Seniors	539	7.43	8.07
Heating, Air Cond. & Refrigeration			
Juniors	424	7.83	8.33
Seniors	318	7.72	8.30
Electronics			
Communication Products Electronics			
Juniors	749	8.15	8.76
Seniors	649	8.02	8.66
Industrial Electronics			
Juniors	566	7.58	8.15
Seniors	457	7.56	8.20
Graphic Communications			
Drafting			
Juniors	942	7.89	8.33
Seniors	743	7.86	8.40
Lithographic Printing			
Juniors	630	7.76	8.59
Seniors	457	7.58	8.64
Metal Trades			
Machine Trades			
Juniors	1,457	7.78	8.41
Seniors	1,203	7.63	8.26
Sheet Metal			
Juniors	62	6.53	6.99
Seniors	42	5.43	5.77
Welding			
Juniors	1,357	8.20	8.74
Seniors	1,084	8.06	8.62
Personal Services			
Cosmetology			
Juniors	1,824	8.23	9.01
Seniors	1,577	7.86	8.82

USES OF THE TEST BATTERY

IMPROVEMENT OF INSTRUCTION

The occupational test results can be utilized to identify strong and weak areas of instruction and may indicate a need for some curriculum reorganization.

The lack of equipment or poor quality of equipment may be identified as a cause for student ineffectiveness.

The occupational achievement scores can aid an instructor in the evaluation of the student's performance in relation to the student's academic aptitude.

The testing program may motivate instructors and students toward higher achievement and will therefore assist the learning process.

Rank order correlations can be computed by local schools using lab grades and Achievement Test scores. Comparisons of basic instructional units listed on a progress chart with occupational subtest scores can also be made

Vocational Administrator, Supervisor and Instructor Conference Questions

Periodic conferences among administrators, supervisors and instructors are essential to sound program improvement. These conferences are important if program and instructional improvement plans and priorities are to be achieved. However, comparisons of one teacher to another teacher should not be attempted. Each teacher's program must be considered on an individual basis.

To effectively use the Achievement Test results for instructional improvement, the administrator, supervisor and instructor need to analyze the results jointly. They should review the test results by comparing anticipated results with obtained results. The program course of study should be used to interpret the breadth and depth of sub-test titles. Typical questions that the administrator, supervisor and instructor need to consider jointly are as follows:

1. Why did individual students do well?
2. What observed student weaknesses are substantiated by the test scores?
3. Why did individual students score low?
4. Do students believe the results provide a true picture of their knowledge and skills? Why?
5. What instructional weaknesses are illustrated by the class median?
6. What do the Academic Aptitude Test scores tell you about your students?
7. How can over-achievers and under-achievers be identified?
8. What is needed to be more effective with under-achieving students? Below average students?

9. What professional training opportunities may assist program improvement or instructional improvement? (e.g. university course, workshops, additional industrial or business experience, adolescent psychology, human relations)
10. What teaching aids are available that may make teaching more effective?
11. Have all students used all the tools and equipment available? (Check progress charts.)
12. Is all the equipment operable and up-to-date?
13. Does the laboratory layout or facility restrict the instructional process?
14. Is there adequate related instruction time?
15. Is the curriculum too extensive or too limited? If so, what should be eliminated or added?
16. How effective are the current related instruction materials? (textbooks, learner's manual, instructor's guides)

By using the Achivement Test results as indicated above, the Test Battery can be a most effective tool for obtaining quality education. Sound educational conferences between administrators, supervisors and instructors can foster program and instructional improvement.

SCHOOL AND COMMUNITY RESEARCH

Relationship of academic aptitude and vocational achievement may support present student selection procedures or indicate a need for changes in selection techniques.

California Short Form Test of Academic Aptitude scores can be compared with national profiles in group analyses studies.

Schools may provide longitudinal studies of students as they progress through the vocational program.

STUDENT BENEFITS

The test results will provide information to teachers and counselors for job placement.

The teacher and student will have evaluative information concerning the student's ranking in local and state settings.

Students should obtain a better understanding of themselves and their potential.

UTILIZING THE TEST RESULTS

INFORMATION AND DATA RETURNED TO SCHOOLS

A computer print-out of student scores by occupation and grade is returned to each school (Appendix A and Appendix C). This detailed information is of a confidential nature and, as such, is not available for comparisons between schools. This print-out lists the students in rank order on the basis of total occupational score. Student raw scores for each sub-test are indicated as well as sub-total and total scores where appropriate. School medians and means are also presented for local use.

Percentile norm sheets for each occupation and grade are provided in quantities sufficient for plotting each student's scores in addition to the number required for school administration use (Appendix D). The state median is the 50th percentile.

A hypothetically plotted percentile norm sheet showing how the charts can be effectively used is illustrated in Appendix B. Referring to Appendix B, it will be noted that the school's median scores are listed on the extreme left for each sub-test and test. At the extreme right, a student's scores are listed. By plotting the school median scores in red and the student's scores in black, the profile illustrates how the school compares with the state as a whole and how the student ranks with his class and the state.

Teachers normally plot their own class profiles, as in making these profiles the details and trends become apparent. The assignment of the plotting task to supervisors or counselors reduces teacher awareness of the detail and subtle difference between students. Students may also plot their own individual scores. Frequently this approach helps the student become aware of his or her own strengths and weaknesses and assists in the student-teacher discussion of tests results.

SHORT FORM TEST OF ACADEMIC APTITUDE

Educational administrators, supervisors, teachers and the student may use the suggestions below as guides in interpretating the SFTAA results.

1. Generalizations may be made between the SFTAA and occupational achievement test scores by using the percentile norm sheets, as all data reported is based upon the same sample tested.
2. The SFTAA provides a relatively short but accurate estimate of the intelligence level and academic aptitude of the vocational students tested. This information may be useful in verifying selection procedures for vocational students.
3. Test results should help the individual student to obtain a greater self understanding for planning future educational and vocational pursuits.
4. Class results should assist teachers in understanding the academic aptitude and mental abilities of their students.
5. Local schools are encouraged to utilize the SFTAA results in research studies such as:
   a. longitudinal growth studies.
   b. under and over achievement by students.
   c. performance variation caused by various factors while the intelligence factor is held constant.

OCCUPATIONAL TEST SCORES

The occupational test scores, as indicated on the computer print-out (Appendix A) and (Appendix C), may be best interpreted by using the Percentile Norm Sheets (Appendix D).

Suggestions for using the norm charts:

1. Charts can be recorded and kept in a permanent record folder or be kept on file by the vocational teacher for each student. This may be helpful for later employment references.
2. Students may keep charts - but caution should be taken to avoid lay people obtaining school medians. Therefore, it is suggested that the school mean or medians not be recorded on the charts released to students.
3. An overlay (transparent material) of the school median is effective for small group (3-4 participants) or individual discussion.
4. Along with the school median, the individual high and low scores for each test and subtest can be discussed in reference to the state percentiles and range. This may also show group learning tendencies.
5. By using the school median, the student can be identified as being in the upper half or lower half of his school class for each sub-test.
6. The school median can be compared with the state median to determine if it is above or below the state as a whole.
7. Students who take the tests as a junior and again as a senior can compare their raw scores to illustrate growth and direction.
8. Class medians of seniors and their previous junior scores can illustrate program growth and direction.
9. Weaknesses need to be discussed in terms of the course outline and program objectives.
10. The test results can be useful with administrators and advisory committees in understanding the breadth and depth of instruction being offered.

Appendix A

OHIO TRADE AND INDUSTRIAL EDUCATIONAL SERVICES — STATE=OHIO — 1978
DIVISION OF VOCATIONAL EDUCATION-STATE DEPARTMENT OF EDUCATION-COLUMBUS, OHIO

OHIO ACHIEVEMENT TEST-AUTOMOTIVE BODY — RAW SCORES — GRADE=SENIOR — SCHOOL=HOMETOWN H S

STUDENT ID.	NAME	VOC ABU LRY	MEM ORY	SEQ UEN CES	ANA LOG IES	SFT AA TOT	AUTO BODY TOT	WELD ING	REP & STR	PTCH & FILL	FIBR GLAS REPR	PANL REP MENT	RE FINI SHNG	TRIM & HWE	GLAS REPL MENT	FRME & UN RP	SUS PEN SYS	ENG COOL SYS	AIR COND ING	ELEC SYS	SHOP MGMT
62793	NYE, BE	10	11	17	16	54	234	18	23	9	8	15	48	11	10	25	15	6	8	21	17
62783	KUNKLER, RE	14	20	19	16	69	224	21	26	8	9	11	45	14	10	20	14	5	6	22	13
62791	BROWN, JR	14	16	14	15	59	221	19	26	8	12	16	44	12	8	24	10	8	7	10	17
62796	RAE, DJ						221	22	19	14	11	14	39	10	10	28	10	6	4	21	13
62783	SCHMIDT, HB	10	12	14	13	49	213	19	27	12	6	13	41	13	9	16	7	7	10	19	14
62782	OTTAVI, GJ	13	11	5	8	37	200	23	19	7	6	19	39	10	9	20	9	5	2	18	14
62783	MILLER, JG	12	15	17	12	56	199	17	21	6	10	11	39	11	9	20	10	6	4	22	13
62790	HAMMOCK, BM	10	9	13	6	38	186	20	23	8	4	9	38	10	6	21	9	5	3	15	15
62795	HOLSINGER, J						185	18	19	12	8	10	37	11	10	17	9	6	6	14	8
62794	EITEL, EM	7	8	12	15	42	169	19	18	7	5	12	37	10	8	16	4	5	3	15	10
62789	HARKINS, OR	9	6	10	14	39	162	17	20	8	6	12	32	7	6	17	6	6	8	4	13
62792	REA, JD	5	11	4	10	30	162	17	14	2	4	13	26	9	9	15	9	7	3	20	14
62797	HACKETT, DT	13	13	18	11	55	161	15	19	7	11	11	33	9	5	18	4	1	6	14	8
62781	RILEY, MK	11	7	7	12	37	132	18	10	5	4	7	26	9	4	17	8	4	5	9	6
62784	ROEDIGER, A	8	12	10	4	34		21	22	11	5	11	37								
62786	HYNDS, LT	8	5	11	9	33		16	22	10	4	10	38								
MEDIAN		10.0	11.0	12.5	12.0	40.5	192.5	18.5	20.5	8.0	6.0	11.5	38.0	10.0	8.5	17.5	9.0	5.5	4.5	15.0	13.0
MEAN		10.3	11.1	12.2	11.5	45.1	190.6	18.8	20.5	8.4	7.1	12.1	37.4	9.1	7.1	17.1	7.8	4.8	4.7	14.0	10.9

LANGUAGE (VOC+MEM) MEAN = 21.4 MEDIAN = 20.5 NON-LANGUAGE (SEQ+ANAL) MEAN = 23.7 MEDIAN = 25.5

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Percentile Norm Sheets: (Appendix B)

Listed on the left side of each Percentile Norm Sheet (Appendix B) are the names of the tests and their sub-tests. The top seven lines refer to The California Short Form Test of Academic Aptitude (SFTAA), with the SFTAA total score being the seventh line. This is then followed by the total score for the occupational test. The various occupational sub-tests complete the listing.

The numbers printed to the right of the test or sub-test listings are raw scores. These scores are in a percentile distribution, reading from the 1st percentile to the 99th percentile. The vertical lines represent percentiles. (See numbers immediately below "Percentile Norms") The 50th percentile represents the median for the state.

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A percentile is a point in a distribution below which falls the percentage of cases indicated by the given percentile. For example, the 44th percentile denotes the point at which 44 percent of the scores fall on or below. If a student receives a score at the 44th percentile, this means that he did as well as, or better than, 44 percent of the persons who took that test. Also, 56 percent of the people taking the test scored above that point.

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The Percentile Norm sheet below (Appendix B) is an example of the plotting of the above School Median and a specific student's scores (Appendix A). The School Median has been written in red in the column on the left, the score has been circled in red and these scores connected by red lines. This provides a profile of the above class median and presents a graphic display that can be used in the evaluation of the total program. A student's (RAE, JD) scores have been written in black in the column on the right, these scores have been circled in black and these scores connected by black lines. This provides a profile of this student's scores and presents an opportunity to compare this student with his class

OHIO SENIORS

□ Class Median

OHIO AUTO BODY ACHIEVEMENT TEST

1978

○ Student Score

Instructional Materials Laboratory
Trade and Industrial Education Service
Division of Vocational Education
State Department of Education
Columbus, Ohio

PERCENTILE NORMS

School Median		Student Score
10.0	Vocabulary	5
11.0	Memory	11
20.5	Language Sub-Total	16
12.5	Sequences	4
12.0	Analogies	10
25.5	Non-Language Sub-Total	14
40.5	TOTAL	30
192.5	OABAT TOTAL	162
18.5	Welding	17
20.5	Repair and Straighten	14
8.0	Patch and Fill	2
6.0	Fiberglass Repair	4
11.5	Panel Replacement	13
38.0	Refinishing	26
10.0	Trim and Hardware	9
8.5	Glass Replacement	9
17.5	Frame and Unit Body Repair	15
9.0	Suspension Systems	9
5.5	Engine Cooling Systems	7
4.5	Air Conditioning	3
15.0	Electrical Systems	20
13.0	Shop Management and Operations	14

SFTAA LEVEL 5

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The following examples of a School Score Printout (Appendix C) and Percentile Norm Sheet (Appendix D) are provided for your use in practice plotting.

A. After plotting the School Medians on the Percentile Norm Sheet try to answer the following questions:
   1. Is the class above, below or about average in the occupational portion of the test? The Academic Aptitude Test?
   2. Did the class attain an achievement level in the occupational test equal to their Academic Aptitude level?
   3. What sub-test areas should be emphasized by the Senior year instructor?
   4. Which sub-test area could be covered briefly by the Senior year instructor?

B. Plot the test scores for Crow and Schmidt using different colored markers or pens.
   1. Considering the SFTAA socres, which student is overachieving? Underachieving?
   2. What are Crow's strongest two areas? The two weakest areas?
   3. In which areas could the Senior year instructor consider individualized instruction for Schmidt?

OHIO TRADE AND INDUSTRIAL EDUCATIONAL SERVICES — STATE=OHIO — 1978
DIVISION OF VOCATIONAL EDUCATION=STATE DEPARTMENT OF EDUCATION=COLUMBUS, OHIO

OHIO ACHIEVEMENT TEST=CLERK=STENOGRAPHER — RAW SCORES — GRADE=JUNIOR — SCHOOL= YOUR JVS

STUDENT ID.	NAME	VOC ABULARY	MEMORY	SEQUENCES	ANALOGIES	SFTAA TOT	CLK. STENO.	DICTATION	CORRESPOND	FINANCREC	COMMUNICATN	COPY REPRODUCT	REC ORD MGT	PERDEVELOPE
95049	CROW, RR	12	12	13	12	49	177	14	71	26	19	17	19	11
95055	ANDERSON, RL	16	13	14	16	59	175	15	71	27	22	12	21	13
95052	GREEN, DE	22	15	17	4	58	172	16	73	26	20	15	17	11
95064	STUART, ME	11	19	19	13	60	164	13	65	25	21	13	14	13
95063	MARTINKOSKI, RA	19	11	15	13	57	163	16	59	22	17	15	18	16
95053	SCHMIDT, NJ	22	7	19	14	62	153	13	66	21	15	11	17	10
95056	ROBERTS, LM	13	12	11	16	49	142	12	62	16	15	9	18	10
95061	CRANFIELD, LT	16	13	14	12	55	138	14	58	16	14	15	10	11
95057	STOKES, KL	12	12	11	14	49	132	11	48	24	16	15	13	5
95050	ROGERS, SA	15	13	9	11	48	131	11	59	16	9	10	13	13
95060	BARILLE, SL	14	6	17	12	49	128	9	57	13	17	11	10	11
95054	CHEYNEY, AL	10	10	17	16	53	90	13	40	8	13	4	9	3
95051	RICE, MC	14	9	16	10	49					24	13	17	9
	MEDIAN	14.0	12.0	15.3	13.0	53.0	147.5	13.0	59.0	20.0	17.0	13.0	17.0	11.0
	MEAN	14.3	11.6	14.7	12.5	53.6	147.1	12.1	56.1	17.5	17.1	12.3	15.1	10.5

LANGUAGE (VOC+MEM) MEAN = 26.4 MEDIAN = 28.0 NON-LANGUAGE (SEQ+ANAL) MEAN = 27.2 MEDIAN = 27.0

31 32

OHIO JUNIORS

OHIO CLERK–STENOGRAPHER ACHIEVEMENT TEST

1978

Instructional Materials Laboratory
Trade and Industrial Education Service
Division of Vocational Education
State Department of Education
Columbus, Ohio

School Median

Student Score

PERCENTILE NORMS

1 2 3 4 5 10 20 30 40 50 60 70 80 90 95 96 97 98 99

SFTAA LEVEL 5

- Vocabulary
- Memory
- Language Sub-Total
- Sequences
- Analogies
- Non-Language Sub-Total
- TOTAL

- OCSAT TOTAL
- Dictation
- Correspondence
- Financial Records
- Communications
- Copy Reproduction
- Record Management
- Personal Development